



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant:

Zilan Shen

Serial No.: 09/904,237

Filed: July 12, 2001

For: Fused Passive Organic
Light Emitting Displays

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Art Unit: 2822

Examiner: Ida M. Soward

Atty Docket: ITL.0582US
P11591

#10/appeal
Brief
A. Soward
10/15/03

Mail Stop **Appeal Brief-Patents**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Applicant respectfully appeals from the final rejection mailed July 1, 2003.

I. REAL PARTY IN INTEREST

The real party in interest is the assignee Intel Corporation.

II. RELATED APPEALS AND INTERFERENCES

None.

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Date of Deposit: 10/1/2003
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Lynda K. Self

III. STATUS OF THE CLAIMS

Claims 1-10 and 18-25 were rejected. Each rejection is appealed.

IV. STATUS OF AMENDMENTS

All amendments have been entered.

V. SUMMARY OF THE INVENTION

A pixel of an organic light emitting device (OLED) display 10 includes a transparent column electrode 12 and a transverse row electrode 14a as indicated in Figure 1. In some cases, the column electrode 12 is made of indium tin oxide (ITO) so that light emitted by the OLED material 16 passes outwardly through the column 12. The row electrode 14a is coupled by a thin region or fuse 20 to a contact 22 on one surface of the OLED material 16. An insulator 18 may be provided to separate the row electrode 14a from the column electrode 12. A depression 24 may be formed in the insulation 18 to create an opening to contact the OLED material 16 in one embodiment.

Referring to Figure 2, the fuse 20 is an extension from the row electrode 14a that extends downwardly to an enlarged contact 22 in the opening 24. In some embodiments by offsetting the row electrode 14a upwardly with respect to the OLED material 16, the fuse 20 may be provided without substantially increasing the footprint or space required for each pixel of the display 10. See specification at page 3, line 17 through page 4, line 10.

Conventionally, the row electrode 14a is made of a metal such as aluminum. The fuse 20 may utilize the electron migration behavior of thin film metal interconnection lines. For example, for an 80 nanometer thick aluminum line, the electron migration limit is about 10

milliamps per micron. If the current density in the thin metal fuse 20 is higher than the electron migration limit, local heating occurs, causing the fuse 20 to burn out. Therefore, the electron migration limit can be used to form a fuse such that when the current exceeds the electron migration limit, the fuse burns out, stopping the current flow.

In some embodiments, the insulator 18 prevents shorts between the row and column electrodes 14a and 12 while also defining the OLED pixel. The insulator 18 may be, for example, oxide or nitride material. The width of the fuse 20 may be designed so that it does not add too much resistance when the OLED pixel functions properly.

For example, for a 40 row display, a 100 micron by 100 micron OLED pixel may use about 10 volts and 10 milliamps peak current to produce constant brightness of about 100 candelas in one embodiment. The resistance of the fuse 20 may be as much as about 1 ohm without disturbing the circuit's function. Since the resistance of the row 14 is about .06 ohms per square centimeter, a 20 micron long, 10 micron wide fuse adds about .1 ohms to the circuit. When the OLED is shorted, the current on the fuse is about 10 volts per 0.3 ohms or 100 amps. The electron migration limit for a 10 micron line is about 100 milliamps which is much less than 100 amps.

Therefore, when an OLED pixel is shorted, the current passing through the fuse 20 is large enough to cause the electron migration limit to be exceeded, thereby burning open the fuse 20. As a result, the shorted OLED pixel is then disconnected from the driving circuit formed by the row and column lines. This shorted OLED pixel causes only one dark spot in the display 10. This single dark spot may be much less noticeable than adversely affecting an entire row. See specification at page 4, line 11 through page 5, line 23.

VI. ISSUES

- A. Is Claim 1 Obvious Over Montague and the Alleged Admitted Prior Art of Figures 7-8?

VII. GROUPING OF THE CLAIMS

All of the claims may be grouped with claim 1.

VIII. ARGUMENT

- A. Is Claim 1 Obvious Over Montague and the Alleged Admitted Prior Art of Figures 7-8?

Claim 1 calls for a display. There is no display in Montague. Claim 1 further calls for a light emitting material between a first and second electrode. Montague teaches no such thing. Instead, the Examiner cites the fuseless display mentioned as prior art in the application.

In order to make out a *prima facie* obviousness rejection, there must be some rationale within the references themselves to make the claimed combination. Certainly the discussion of the cited prior art in the present application does not suggest making any modification, but to the contrary, demonstrates considerable disadvantages inherent in the prior art. Nothing in Montague in any way suggests modifying how displays are made since Montague does not have anything to do with a display and is merely a fuse for a plug.

It bears noting that the argument that Montague and the admitted prior art both come from the field of fuse structures is plainly erroneous. There is no discussion of a fuse in connection with Figures 7 and 8 of the present application. The Examiner is applying the teaching of Appellant's entire specification, including the teaching of the claimed invention, to use fuses as prior art, just because Figures 7 and 8 are prior art fuseless displays: This is a plainly erroneous application of hindsight reasoning.

In view of the failure to make out a *prima facie* rejection, the rejection should be reversed.

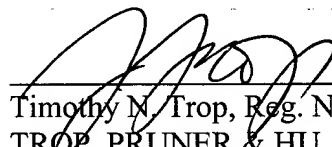
IX. CONCLUSION

Applicant respectfully requests that each of the final rejections be reversed and that the claims subject to this Appeal be allowed to issue.

Respectfully submitted,

Date: _____

10/1/03



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APPENDIX OF CLAIMS

The claims on appeal are:

1. A display comprising:
a first electrode;
a second electrode;
a light emitting material between said first and second electrodes; and
a fuse between said first electrode and said light emitting material.
2. The display of claim 1 wherein said first electrode is a row electrode.
3. The display of claim 2 wherein said second electrode is a column electrode.
4. The display of claim 1 wherein said second electrode is a transparent electrode and said first and second electrodes are deposited on a transparent sheet.
5. The display of claim 1 wherein said light emitting material is an organic light emitting material.
6. The display of claim 1 wherein said fuse is formed integrally with said first electrode.
7. The display of claim 6 wherein said fuse is formed as a reduced width section of said first electrode.
8. The display of claim 7 wherein said fuse extends transversely from said first electrode.
9. The display of claim 8 wherein said fuse includes a contact that contacts said light emitting material, said fuse including a fusible element between said contact and said first electrode.

10. The display of claim 9 wherein said fuse is formed of a material that fails by electron migration when the current density through said fuse exceeds a limit

18. A display comprising:
a substantially transparent electrode;
a substantially non-transparent electrode extending generally transversely to said transparent electrode;
an organic light emitting material between said transparent and non-transparent electrodes; and
a fuse between said non-transparent electrode and said organic light emitting material.

19. The display of claim 18 wherein said transparent electrode is a column electrode and said non-transparent electrode is a row electrode.

20. The display of claim 18 wherein said fuse is integral with said non-transparent electrode.

21. The display of claim 18 wherein said fuse is a reduced width section of said non-transparent electrode.

22. The display of claim 18 wherein said fuse extends generally transversely to said non-transparent electrode.

23. The display of claim 18 wherein said fuse is formed of a material that fails by electron migration when the current density through said fuse exceeds a limit.

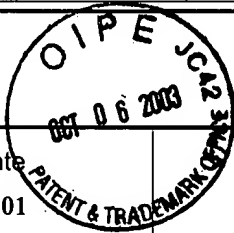
24. The display of claim 23 wherein said fuse is formed of the same material as said non-transparent electrode.

25. The display of claim 18 wherein said fuse includes a contact that contacts said organic light emitting material, said fuse including a fusible element between said contact and said non-transparent electrode.

TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.
ITL.0582US

In Re Application Of: Zilan Shen



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09/904,237

Filing Date
July 12, 2001

Examiner
Ida M. Soward

Group Art Unit
2822

Invention: FUSED PASSIVE ORGANIC LIGHT EMITTING DISPLAYS

TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on September 17, 2003

The fee for filing this Appeal Brief is: \$330.00

- ☒ A check in the amount of the fee is enclosed.
- ☐ The Director has already been authorized to charge fees in this application to a Deposit Account
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 20-1504

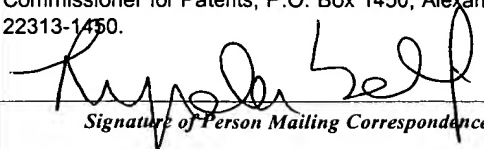
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Dated: 10/1/03

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